



Call: H2020-SC5-2014-two-stage

Topic: SC5-01-2014

PRIMAVERA

Grant Agreement 641727



**PRocess-based climate sIMulation: AdVances in high resolution modelling and
European climate Risk Assessment**

Deliverable D11.1

End-user Dissemination and communication plan

Deliverable Title	<i>End-user Dissemination and Communication plan</i>	
Brief Description	<i>This report will detail the measures to be adopted during and after the project and illustrate how the proposed measures will achieve the expected impacts (Section 2.1). It will address the full range of potential users and uses as indicated in T11.2</i>	
WP number	WP11	
Lead Beneficiary	BSC	
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Creation Date	13.01.2016	
Version Number	V1	
Version Date	22.02.2016	
Deliverable Due Date	M3 (Jan 2016), Postponed to M4 (Feb 2016)	
Actual Delivery Date	29.02.2016	
Nature of the Deliverable	<input checked="" type="checkbox"/>	<i>R - Report</i>
	<input type="checkbox"/>	<i>P - Prototype</i>
	<input type="checkbox"/>	<i>D - Demonstrator</i>
	<input type="checkbox"/>	<i>O - Other</i>
Dissemination Level/ Audience	<input checked="" type="checkbox"/>	<i>PU - Public</i>
	<input type="checkbox"/>	<i>PP - Restricted to other programme participants, including the Commission services</i>
	<input type="checkbox"/>	<i>RE - Restricted to a group specified by the consortium, including the Commission services</i>
	<input type="checkbox"/>	<i>CO - Confidential, only for members of the consortium, including the Commission services</i>

Version	Date	Modified by	Comments
V1	22.02.2016	Isadora Jiménez	Collaborative draft included in the PRIMAVERA template
V2	03.02.2016	Isadora Jiménez	Janette Bessembinder and Paul Van Der Linden comments implemented.

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1. Executive Summary

A common barrier to the use of climate information is a mutual lack of understanding between the capabilities of the producers of climate science and the needs of the users. Results produced by scientific projects often are not directly in the format that can be used by private business stakeholders. The User Engagement Plan aims to provide PRIMAVERA with a strategy for the dissemination and communication activities specifically addressed to engage business sector stakeholders. This document defines target sectors, describes the planned user-engagement measures and provides a detailed action plan to implement these measures and evaluate their impact throughout the project.

2. Project Objectives

With this deliverable, the project has contributed to the achievement of the following objectives (DOA, Part B Section 1.1) WP numbers are in brackets:

No.	Objective	Yes	No
A	To develop a new generation of global high-resolution climate models. (3, 4, 6)		X
B	To develop new strategies and tools for evaluating global high-resolution climate models at a process level, and for quantifying the uncertainties in the predictions of regional climate. (1, 2, 5, 9, 10)		X
C	To provide new high-resolution protocols and flagship simulations for the World Climate Research Programme (WCRP)'s Coupled Model Intercomparison Project (CMIP6) project, to inform the Intergovernmental Panel on Climate Change (IPCC) assessments and in support of emerging Climate Services. (4, 6, 9)		X
D	To explore the scientific and technological frontiers of capability in global climate modelling to provide guidance for the development of future generations of prediction systems, global climate and Earth System models (informing post-CMIP6 and beyond). (3, 4)		X
E	To advance understanding of past and future, natural and anthropogenic, drivers of variability and changes in European climate, including high impact events, by exploiting new capabilities in high-resolution global climate modelling. (1, 2, 5)		X
F	To produce new, more robust and trustworthy projections of European climate for the next few decades based on improved global models and advances in process understanding. (2, 3, 5, 6, 10)		X
G	To engage with targeted end-user groups in key European economic sectors to strengthen their competitiveness, growth, resilience and ability by exploiting new scientific progress. (10, 11)	X	
H	To establish cooperation between science and policy actions at European and international level, to support the development of effective climate change policies, optimize public decision making and increase capability to manage climate risks. (5, 8, 10)		X

3. User-engagement Plan

3.1 Introduction

An integral part of WP10 and WP11 of the PRIMAVERA project is the engagement with users from identified economic sectors to configure the experimental design so that the project outputs are relevant for end-users and shared in the format that promotes their exploitation. In this context, WP11's user engagement includes both dissemination and communication activities specifically addressed to engage **business sector stakeholders**. WP8 will address the dissemination and exploitation of the results to government, policy-makers and scientific communities and WP7 to the public and other target audiences.

The aim of this document is to define the target sectors, describe the planned user-engagement measures and provide a detailed action plan to implement these measures and evaluate their impact.

PRIMAVERA's specific objective *g* is to engage with targeted end users in key European economic sectors to strengthen their competitiveness, growth, resilience and ability by exploiting new scientific progress. To reach this objective, user engagement activities can address three different goals:

- G1. Engage user groups from key economic sectors in the development of the project to ensure active collaboration and exploitation of PRIMAVERA's scientific outcomes on high-resolution global climate modelling.
- G2. Ensure that the project produces and assesses the climate variables, physics and statistics which are most relevant to the end users, fostering co-development and a constant feedback between the climate community and the industry stakeholders.
- G3. Produce information materials adapted to business-sector users summarizing the main outputs of the project regarding risk assessments and the design of climate risk response strategies.

Note that the general project dissemination and exploitation plan (DEP) and the media and communication plan will be addressed in D7.3 and D7.4 (due in M6) and are out of the scope of this document. WP11 will interact with WP7 to ensure coherence between D11.1 and D7.3 and D7.4 regarding economic sector users/stakeholders.

3.2. Overview user-engagement matrix

Table 1. User engagement matrix

	User engagement measure	Goal	Target sector	WP11 Tasks	Contributors	WP7 liaison	Action plan
1	Meetings with users	G1, G2, G3	All	T11.2/3/4	BSC, KNMI, MET OFFICE, UREAD	General information material	M1-M48
2	Expert interviews and surveys	G1, G2	All	T11.3/4	BSC, KNMI, MET OFFICE, UREAD	Consent forms and Confidentiality guidelines	M12-M36
3	End-user workshops	G1, G2	All	T11.7	BSC, KNMI, MET OFFICE, PREDICTIA, UREAD	Dissemination of the actions	M24-M48
4	Communication material	G2, G3	All	T11.6	BSC, KNMI, MET OFFICE, PREDICTIA, UREAD	Website dissemination	M6-M48
5	PRIMAVERA User Interface Platform (UIP)	G1, G2, G3	All	T11.5	BSC, PREDICTIA	Dissemination of the actions and media coverage	M6-M18
6	Visual prototype for the wind energy sector	G2	Wind Energy	T11.3	BSC, UREAD	Dissemination of the actions and media coverage	M24-M36
7	Attendance to sector-specific and cross-sectoral conferences	G1, G3	All	T11.7	BSC, KNMI, MET OFFICE, PREDICTIA, UREAD	Dissemination of the actions	M24-M48
8	Cross-project user engagement actions	G1, G3	All	T11.2/3/4/7	BSC, KNMI, MET OFFICE, PREDICTIA, UREAD	Dissemination of the actions	M1-M48

3.3. Monitoring and evaluation

The user-engagement measures that will be described below are an initial proposal for the first phase of the PRIMAVERA project. Each measure has Key Performance Indicators (KPI) that will be recorded to measure the communication effort and evaluate the effectiveness of the measure. The activities carried out for each measure and the values of the KPIs will be documented in the Project Periodic Reports every 18 months and the final report (D11.5 due in M48).

The partners are encouraged to identify which dissemination and user-engagement activities have been successful and which activities have not worked well. This plan is a live document that will be periodically revised and adapted when necessary to reflect the lessons learnt in each measure.

The specific risks that have a potential to impact this user engagement plan are detailed in Table 2, together with the proposed risk-mitigation measures.

Table 2. Risks for implementation

Description of risk	Risk-mitigation measures
Unable to engage enough users within a target sector	Communication material and “demonstration of principle” activities will be created as part of the project to highlight the value of engaging with PRIMAVERA. Virtual meetings to reduce time and travel investment from users and promote their participation. Seek and share experience with other EU projects with user engagement for that target sector.
User fatigue leading to lack of engagement	Promote the synergies and joint activities with International, National and EU funded projects (JPI climate, Copernicus C3S, H2020) when linked to a common target sector. Liaison with WP7 and WP8 to avoid overlap regarding target users.
Knock-on impact from delays in other WPs to timely delivery of WP11 activities	Communication with other WPs leads via EMB meetings and other methods to ensure any such risks are identified as early as possible. Seek to use alternative datasets (e.g. CMIP5) for “demonstration of principle” activities.
Unable to obtain (all) climate information required by the users and, hence, unable to deliver all aspects of the sector specific risk assessments	Review the list of parameters output by the climate models to make sure that as much as possible of the climate information relevant to users (and known to WP10/11) can be prepared.

Description of risk	Risk-mitigation measures
Unable to assess the impact of different scenarios/climate drivers on European climate at high resolution	Select a subset of contrasted scenarios to ensure delivery of reasonable uncertainty estimates as input to scientific risk assessment.

To minimise these risks during the implementation of the plan there will be a follow-up from WP leaders:

- Monthly - a short review of coming user-engagement activities by each partner will be addressed in the WP10/11 liaison teleconferences.
- Annually - in each General Assembly, a strategic meeting will be held to review the user-engagement strategy (analyse KPIs, measures of performance and detail any changes needed) and elaborate the work plan for the following year (measures, timelines, etc.).

Any changes in the KPIs, the work plan or the user-engagement measures will be also reported in the Project Periodic Reports and the final report. Any risk detected and not solved with the risk-mitigation measures detailed above will be informed to the scientific coordinator of PRIMAVERA that is responsible for the management of the risks within the project (WP8, T8.6).

3.4 User-engagement measures

In this section the various user engagement measures summarized in Table 1 are described in more detail based in the WP11 work plan given in the PRIMAVERA Description of Action.

3.4.1 Inventory of potential sectors and users

The first step of the user engagement plan will be identifying companies and organizations within the target sectors with potential interest in PRIMAVERA outcomes and create the list of people to be contacted (key contacts per organization). WP11 partners already have extensive contacts in each sector but this measure aims to make a more systematic review of potential users, update and add new users to the list and ensure that the list covers a wider range of users and stakeholders across Europe.

This measure will be carried out throughout the project from M1 to M48, but main efforts will be during the first year (M1-M12).

The main Key Performance Indicators (KPI) are:

- Number of different organisations/users in the list
- Number of originating countries of the targeted organisations

3.4.2 Meetings

Meetings will be organised to engage with business sector users with potential interest in climate projections. These meetings will be carried out throughout the project from M1 to M48. Interactions at the beginning of the project from M1 to M8 will be “demonstration of principle” activities to translate outputs from climate models into relevant information for the target sectors and identify users’ needs. As PRIMAVERA produces user-relevant outputs, some meetings will be scheduled to inform on advances of the project.

The first meetings will be carried out with the users listed in the Inventory. The users contacted and by the WP partners will be listed in Appendix 1. Throughout the project, the information of any new user engaged will be either included or updated in Appendix 1. The conclusions of all the meetings carried out will be recorded in Appendix 2 and made available to the project partners in the internal PRIMAVERA wiki within WP11 section. Appendix 1 and 2 will be defined for Restricted Use and will not be made public.

The main KPIs are:

- Number of different institutions/end-users engaged
- Number of meetings carried out every year

3.4.3 Expert interviews and Surveys

Unlike meetings, expert interviews are a systematic approach to a number of experts with an interview protocol to understand, for instance, sector related information otherwise not accessible, make a qualitative assessment of user engagement or prepare surveys. Semi-structured interview protocols with key users will be developed and implemented to assess whether users find the PRIMAVERA results credible, actionable and salient. This type of measure will be used, for instance, from M24 to M36 to evaluate the user interaction with the visualisation tool (D11.4).

Interview protocols are time consuming activities that can only reach a limited number of users. Thus, surveys will be conducted from M12 to M36 at the sectoral level targeting the users identified in Appendix 1 and in the activities carried out to have a wider perspective on how the project outcomes strengthen the competitiveness and growth of companies (D11.5). They will also be used from M37 to M48 to gather user feedbacks to the workshops.

Both expert interviews and surveys will follow the confidentiality principles and guidelines described in Annex1 of D7.6 and all interviewees will sign a pre-prepared consent form for personal data protection and data storage (Annex 2 of D7.6). The confidentiality principles are based on rules regarding data protection, the European Commission’s Horizon 2020 guidelines, plus the PRIMAVERA Grant and Consortium Agreements. The context and general description of ethics for confidentiality in the project is available in Section 5.1 (Ethics) of the PRIMAVERA Description of Action.

The analysis and the summary statistics of the surveys will be documented and reported in the Project Periodic Reports and the main conclusions derived from some of the surveys will be used in D11.5.

The main KPIs are:

- Total number surveys conducted
- Number of participants/survey

3.4.4 User workshops

The PRIMAVERA partners will participate in and/or deliver end-user workshops to get direct feedback from a user perspective by actors not usually linked to the weather and climate research communities. This will facilitate the co-production and maximise both exploitation and engagement. These activities will be organized, when possible, within sector-specific conferences as side events or short events within the program. Alternatively, virtual workshops will also be considered to promote the participation of interested users with time or travel constraints.

The participation in end-user workshops can provide relevant information to the project from M1 to M48. However, PRIMAVERA-led workshops will be delivered at the end of the project from M24 to M48.

The main KPIs are:

- Number of workshops delivered
- Number of participants/workshop

3.4.5 Communication material

Specific guidance material will be created to describe the value and role of climate projections for the target sectors, and provide examples of how the results of PRIMAVERA contribute to a better understanding of the climate risks up to 2050. This material will be based on the sector-specific case studies developed in WP10.

Climate projection factsheets will also be created describing the basics behind climate projections up to 2050 that will complement the factsheets created in the FP7 SPECS project for seasonal-to-decadal predictions.

These materials will be created from M6 to M48 and published online in the PRIMAVERA User Interface Platform (UIP)

The main KPIs are:

- Number of sector specific case studies published online
- Number of factsheets published online
- Number of visits and downloads

3.4.6 *PRIMAVERA User Interface Platform (UIP)*

A separate user-oriented section of the PRIMAVERA website will be designed to maximise the dissemination of the user-relevant outcomes of the project to the target sectors. This UIP will be used to host any communication material that is sector-specific and will facilitate the ongoing engagement amongst users. The UIP will be designed and developed from M6 to M18. It will build on other initiatives in Europe (e.g. the KNMI climate data atlas initiative or the ECA&D website) and connect to similar and related initiatives developed in climate service projects, such as FP7 EUPORIAS sector specific microsites.

The main KPIs are:

- Number of visits to the UIP from launch to the end of the project

3.4.7 *Visual prototype for the wind energy sector*

A visual prototype will be created for a particular sector to demonstrate the effectiveness of visual interfaces to improve end-user understanding and use of climate projections and their related uncertainty.

The selected sector will be the wind energy industry as it allows building the tool on the visual prototype concept developed in the FP7 project EUPORIAS for seasonal time scales.

In the first stage, from M1 to M12, the users' feedbacks on how to visualise projections will be gathered in the meetings with wind energy users. From M24 to M26 a review of visualisations already available will be prepared. In the development stage, from M24 to M36, a selected number of users will be engaged in providing detailed and iterative feedback to the design decisions for the visual prototype. After the prototype is ready a large set of users of the energy sector will be asked to participate in a survey to evaluate the tool and provide final comments for the improvement of the tool before the launch of the visual prototype via the UIP to a wide end-user audience in M36 (D11.4)

The advances of the visual prototype development will be documented in the Project Periodic Reports and the main conclusions from the evaluation survey and the lessons learnt from the prototype will be documented in the final report .

The main KPIs are:

- Number of users to participate in the prototype evaluation
- Number of visits to the UIP of the visual prototype from launch to the end of the project

3.4.8 *Sector-specific and cross-sectoral conferences*

To illustrate the benefits of high resolution climate projections to a range of stakeholders, the partners will participate in relevant external events or initiatives organized by the target sectors (e.g. European Wind Energy Association Annual Event, the bi-annual Transport Research Arena or the Understanding risk conference) or cross-sectoral conferences

connecting stakeholders with policy makers and academics (e.g. Adaptation Futures 2016, ECCA2017).

All the prospective conferences to be attended and those with actual presence of WP11 partners will be recorded in Appendix 3 and made available for the project partners in the internal PRIMAVERA wiki within the WP11 section. The project office will be closely informed to include these activities in WP7 reports on completed and planned communication activities (T7.5).

The participation in these conferences will be of interest during all the project but the partners will be particularly involved in them from M24 to M48.

The main KPIs are:

- Number of conferences attended
- Number of posters presented
- Number of oral presentations

3.4.9 Cross-project user engagement actions

One of the priorities of WP11 is to maximise the interaction with users while promoting the synergies with the user-engagement strategies of other EU projects. Partners involved in projects such as IMPREX, ClimatEurope, CLIM4ENERGY, ECEM or ERA4CS will promote the collaboration and joint organization of user engagement activities when linked to a common target stakeholder to avoid users' fatigue and maximise the relevant information obtained from each interaction.

The main KPIs are:

- Number of joint initiatives
- List of joint actions with EU and other international projects

3.5 Target sectors

WP11 partners have identified the following business sectors that are likely to be interested in the project outputs and, therefore, should be targeted for the user engagement measures:

Table 3. Target sectors description

Target sector	Target users	Climate information needs
Energy	Weather and Climate analysts within wind farm operators, project developers, project investors, consultants and energy trading companies	to evaluate and explore measures to manage the risk of future variations in wind power supply over the investment time-frames and for the planning of long-term strategies (site selection, transmission requirements, storage and reserve requirements, etc.)
	Intermediary researchers in the energy sector (R&D departments) that facilitate the translation of climate information into energy impacts for the energy sector, including: power TSO, energy system consultants and operation and planning managers in the energy sector.	to improve climate adaptation measures in the thermoelectric power sector (vulnerable to low streamflows and increased temperatures) and to inform power grid design to take into account climate-driven changes in supply and demand [these are only some of the topics that might be addressed]
Transportation	Experts at national and European rail companies in charge of weather and climate change resilience or climate change adaptation	to respond to wind-related risks (overturning trains, trees on lines, damage to overhead lines, etc.) regarding the long term planning of the rail network [Note: expected primary requirement is to address wind-related risks, but other risks may also be considered]
Finance and insurance	Risk managers within insurance and finance companies	to properly assess the financial risks of (re)insurances and assets and spreading of risks related to climate (type and intensity of climate extremes, spatial distribution and variation and simultaneity)
Agriculture and food security	Climate advisors within large winery companies, olive oil and crop producers	to assess the risks and opportunities of future variations in Temperature and precipitation to anticipate changes in crop yields and their potential socioeconomic impacts regarding food security and support decisions on long term agricultural planning (variety, irrigation systems and regions to plant)

Other potential sectors such as health for the impact of heat stress or the link between surface air temperature and diseases- will be considered for inclusion as target sectors if potential users are identified. Likewise other identified economic sectors may be included throughout the project.

APPENDIX 1 - List of users

Target sector	Stakeholder	Description	Contact partner	Contact protocol
<i>e.g. Wind Energy</i>	<i>e.g. EDPR</i>	<i>e.g. Interested in long-term extreme wind conditions</i>	<i>e.g. BSC</i>	<i>e.g. To be contacted by BSC. Sensitive information on business activity shared. Confidentiality agreement signed.</i>

APPENDIX 2 - Follow-up of user interactions

Target sector	Target users	Date	Type of interaction	Contact partner	Description
<i>e.g. Wind Energy</i>	<i>e.g Energy traders from different firms</i>	<i>e.g. 2015 11 30</i>	<i>e.g. Workshop</i>	<i>e.g. BSC</i>	<i>e.g Workshop within the EWEA annual event to present...</i>

APPENDIX 3 - Sector-specific and cross-sectoral conferences

Title	Date	Place	Target sector	Target users	Size of audience	Countries addressed	Expected impact	Details
<i>EWEA Annual Event</i>	<i>17-19 November 2015</i>	<i>Paris, France</i>	<i>Wind Energy</i>	<i>wind farm operators, climate consultants</i>	<i>Thousands</i>	<i>European countries</i>	<i>Presentation of climate visualisation prototype</i>	

4. Deviations from DoA

The D11.1 was initially planned for Month 3. As the Kick-off Meeting took place at the end of Month 1, the initial work plan was slightly delayed. The input received in the Kick-off meeting was essential to properly address the End-Users Dissemination Plan, so the deliverable had the same delay as the kick-off meeting. A one month postponement was granted for the submission of the D11.1 assuring the quality and proper involvement and feedback from all the partners.

This postponement will not affect any of the next WP Deliverables (D10.1 due in M12 and D11.2 due in M20) and has almost no impact in Task 11.2 (identifying end-user needs).

5. Lessons Learnt

The meetings with users at the beginning of the project from M1 to M8 are not only a first approach to the users within the target sectors but a necessary step to provide a more detailed timeline for the implementation of the measures described in this plan

6. Links Built

WP11 will have a close interaction with WP10. We have established a WP10/11 liaison teleconference which takes place monthly.

WP11 will have constant interactions with WP7 regarding communication actions. Both WPs have had liaison regarding the confidentiality principles and guidelines (D7.6) that will be needed for some user-engagement measures.